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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/749,971	12/31/2003	Galen W. Kulp	C-2884	9671

7590 10/30/2006

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EXAMINER

RHEE, JANE J

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 10/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/749,971

Applicant(s)

KULP ET AL.

Examiner

Jane Rhee

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Rejections Withdrawn***

1. The 35 U.S.C. 103(a) rejection of claims 1-7 over Reiser et al. in view of Voss and in further view of Perry has been withdrawn due to applicant's amendment filed on 8/15/2006.
2. The 35 U.S.C. 103(a) rejection of claims 8-11 over Reiser et al. in view of Voss and in further view of Perry has been withdrawn due to applicant's amendment filed on 8/15/2006.

***New Rejections***

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-5,7-9,11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuss (6358637) in view of Reiser et al. (2002006583).

As to claims 1 and 8, Fuss discloses a fuel cell system, wherein the system includes at least one fuel cell (figure 1 number 8), having a cathode (col. 1 lines 17-20) secured adjacent one side of an electrolyte layer (col. 1 lines 17-20), an anode (col. 1 lines 17-20) secured adjacent an opposed side of the electrolyte layer, a cathode flow field defined adjacent the cathode and an anode flow field defined adjacent the anode wherein the both the cathode and anode flow fields are filled with air (col.1 lines 20-25),

a fuel inlet valve (figure 1 number 10) and a fuel outlet valve (figure 1 number 14) secured in fluid communication with the anode flow field for permitting and prohibiting flow of the fuel through the anode flow field (col. 2 lines 43-44). Fuss fail to disclose wherein the cathode includes a cathode catalyst supported on a carbon support, and a primary electricity using device is disconnected from the fuel cell power circuit during a shut down of the fuel cell.

Reiser et al. teaches wherein the cathode includes a cathode catalyst supported on a carbon support for the purpose of the residual oxygen in the cathode flow field to react on the catalyst to form water with the residual hydrogen in anode flow field (page 1 paragraph 0009), and a primary electricity using device is disconnected from the fuel cell power circuit during a shut down of the fuel cell for the purpose of stopping the supply of electricity to the primary electricity using device (page 3 paragraph 0028).

Therefore, it would have been obvious to one having ordinary skill in the art at the time applicant's invention was made to provide Fuss with the cathode that includes a cathode catalyst supported on a carbon support in order for the residual oxygen in the cathode flow field to react on the catalyst to form water with the residual hydrogen in anode flow field (page 1 paragraph 0009), and a primary electricity using device is disconnected from the fuel cell power circuit during a shut down of the fuel cell in order to stop the supply of electricity to the primary electricity using device (page 3 paragraph 0028) as taught by Reiser et al.

Fuss discloses the shut down procedure to shut down the cell comprising the steps of closing the fuel inlet valve and the fuel outlet valve to prohibit the flow of fuel

through the anode flow field (col. 2 lines 43-44), then applying a vacuum to the anode flow field (col. 2 lines 45-46), then opening the fuel inlet valve and the fuel outlet valve, then delivering a continuous flow of hydrogen fuel into the anode flow field, then delivering a flow of oxidant into the cathode flow field (col. 3 lines 44-45).

Fuss fail to disclose connecting the primary load to the fuel cell power circuit (page 3 paragraph 0028 and 0025) for the purpose of providing electricity to the primary load.

Therefore, it would have been obvious to one having ordinary skill in the art at the time applicant's invention was made to provide Fuss with connecting the primary load to the fuel cell power circuit in order to provide electricity to the primary load (page 3 paragraph 0025).

As to claim 2, Fuss discloses wherein the step of applying the vacuum to the anode field includes applying a vacuum until an absolute pressure within the anode flow field is between about 60kPa to about 85kPa (figure 2).

As to claim 3, Fuss discloses wherein the steps of applying the vacuum further comprises applying a vacuum to the cathode flow field (col. 2 lines 45-46).

As to claim 4, Fuss discloses wherein the step of applying the vacuum to the cathode flow field includes applying a vacuum until an absolute pressure within the cathode flow field is between 5 kPa to about 15kPa (col. 3 line 10)

As to claim 5, Fuss discloses wherein the step of applying a vacuum to the anode flow field includes applying a vacuum until an absolute pressure within the anode flow field is between 5 kPa to about 15kPa (col. 3 line 10).

As to claims 7 and 11, Fuss fail to disclose the steps of connecting an auxiliary load to the fuel cell power circuit prior to the step of delivering the continuous flow of hydrogen fuel, disconnecting the auxiliary load from the fuel cell power prior to the step of delivering a flow of oxidant to the cathode flow field.

Reiser et al. teaches the steps of connecting an auxiliary load to the fuel cell power circuit prior to the step of delivering the continuous flow of hydrogen fuel for the purpose of lowering the cell voltage (page 3 paragraph 0030), disconnecting the auxiliary load from the fuel cell power prior to the step of delivering a flow of oxidant to the cathode flow field (page 2 paragraph 0015 and figure 1 number 148) for the purpose of reducing cell performance decay during the shut down (page 3 paragraph 0030).

Therefore, it would have been obvious to one having ordinary skill in the art at the time applicant's invention was made to provide Fuss with the steps of connecting an auxiliary load to the fuel cell power circuit prior to the step of delivering the continuous flow of hydrogen fuel in order to reduce the cell voltage, and disconnecting the auxiliary load from the fuel cell power prior to the step of delivering a flow of oxidant to the cathode flow field in order to reduce cell performance decay during the shut down (page 3 paragraph 0030) as taught by Reiser et al.

As to claim 9, Fuss discloses wherein the vacuum source means is also secured in fluid communication with the cathode flow field applying a vacuum when the oxidant inlet valve and oxidant exhaust valve are closed to prohibit flow of the oxidant through the cathode flow field (col. 2 lines 43-46).

4. Claim 6,10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuss in view of Dufner et al. (6617068).

Fuss discloses the fuel cell system described above. Fuss fail to disclose wherein the vacuum fuel cell system includes a porous water transport plate secured in direct fluid communication with the anode flow field and a coolant accumulator, wherein the step of applying a vacuum to the anode flow field further comprises applying a vacuum to the coolant accumulator so that the vacuum level applied to the anode flow field is about the same as the vacuum level applied to the coolant accumulator.

Dufner et al. teaches a porous water transport plate secured in direct fluid communication with the anode flow field for the purpose of passing the reducing fluid fuel though the fuel cell in fluid communication with the anode catalyst (col. 4 lines 13-18).

Therefore, it would have been obvious to one having ordinary skill in the art at the time applicant's invention was made to provide Fuss with a porous water transport plate secured in direct fluid communication with the anode flow field in order to pass the reducing fluid fuel though the fuel cell in fluid communication with the anode catalyst (col. 4 lines 13-18) as taught by Dufner et al.

As to the limitation "for directing a liquid coolant to pass through the water transport plate" is intended use. It has been held that a recitation with respect to the manner in which the claimed particle is intended to be employed does not differentiate

the claimed article from a prior art article satisfying the claimed structural limitations. Ex parte Masham, 2 USPQ2d 1647 (1987)

Dufner et al. teaches a coolant accumulator, wherein the step of applying a vacuum to the anode flow field further comprises applying a vacuum to the coolant accumulator so that the vacuum level applied to the anode flow field is about the same as the vacuum level applied to the coolant accumulator for the purpose of discharging fluid from the accumulator (col. 10 line 61-67).

Therefore, it would have been obvious to one having ordinary skill in the art at the time applicant's invention was made to provide Fuss with a coolant accumulator, wherein the step of applying a vacuum to the anode flow field further comprises applying a vacuum to the coolant accumulator so that the vacuum level applied to the anode flow field is about the same as the vacuum level applied to the coolant accumulator in order to discharge fluid from the accumulator (col. 10 line 61-67).

### ***Response to Arguments***

5. Applicant's arguments with respect to claims 1-11 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).



A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jane Rhee whose telephone number is 571-272-1499. The examiner can normally be reached on M-F 9-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



PATRICK JOSEPH RYAN  
SUPERVISOR/UNIT EXAMINER

Art Unit: 1745

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read "Jane Rhee", with a stylized, cursive script.

Jane Rhee  
October 19, 2006